INSECTA MUNDI

A Journal of World Insect Systematics

0101

A revision of the genus *Maracandula* Currie (Neuroptera: Myrmeleontidae)

Robert B. Miller and Lionel A. Stange
Florida State Collection of Arthropods
P. O. Box 147100
Gainesville, Florida 32614-7100, U.S.A.

Date of Issue: October 25, 2009

CENTER FOR SYSTEMATIC ENTOMOLOGY, INC., Gainesville, FL

Robert B. Miller and Lionel A. Stange
A revision of the genus *Maracandula* Currie
(Neuroptera: Myrmeleontidae)
Insecta Mundi 0101: 1-10

Published in 2009 by
Center for Systematic Entomology, Inc.
P. O. Box 141874
Gainesville, FL 32614-1874 U. S. A.
http://www.centerforsystematicentomology.org/

Insecta Mundi is a journal primarily devoted to insect systematics, but articles can be published on any non-marine arthropod taxon. Manuscripts considered for publication include, but are not limited to, systematic or taxonomic studies, revisions, nomenclatural changes, faunal studies, book reviews, phylogenetic analyses, biological or behavioral studies, etc. **Insecta Mundi** is widely distributed, and referenced or abstracted by several sources including the Zoological Record, CAB Abstracts, etc.

As of 2007, **Insecta Mundi** is published irregularly throughout the year, not as quarterly issues. As manuscripts are completed they are published and given an individual number. Manuscripts must be peer reviewed prior to submission, after which they are again reviewed by the editorial board to insure quality. One author of each submitted manuscript must be a current member of the Center for Systematic Entomology.

Printed copies deposited in libraries of:
CSIRO, Canberra, ACT, Australia
Museu de Zoologia, São Paulo, Brazil
Agriculture and Agrifood Canada, Ottawa, Ontario, Canada
The Natural History Museum, London, England
Muzeum i Instytut Zoologii Pan, Warsaw, Poland
National Taiwan University, Taipei, Taiwan
California Academy of Sciences, San Francisco, CA, USA
Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA
Field Museum of Natural History, Chicago, IL, USA
National Museum of Natural History, Smithsonian Institution, Washington, DC, USA

Electronic copies in PDF format:
Printed CD mailed to all members at end of year.
Florida Center for Library Automation: http://purl.fcla.edu/fcla/insectamundi
University of Nebraska-Lincoln, Digital Commons: http://digitalcommons.unl.edu/insectamundi/

Author instructions available on the Insecta Mundi page at:
http://www.centerforsystematicentomology.org/insectamundi/

Printed Copy ISSN 0749-6737
On-Line ISSN 1942-1354
CD-ROM ISSN 1942-1362

INSECTA MUNDI 0101: 1-10 2009

A revision of the genus *Maracandula* Currie (Neuroptera: Myrmeleontidae)

Robert B. Miller and Lionel A. Stange
Florida State Collection of Arthropods
P. O. Box 147100
Gainesville, Florida 32614-7100, U.S.A.

Abstract. Three new species of *Maracandula* are described from Mexico and included in a key to the five species in Mexico. Diagnoses of the species are given as well as distributional data.

Resumen. Se describen tres especies nuevas de *Maracandula* de Mexico y se incluye una clave de las cinco especies conocidas de Mexico.

Introduction

Species of *Maracandula* Currie are small, afternoon flying antlions restricted to Mexico. There are five known species representing two species groups. The colima group is more similar to species of *Menkeleon* Stange than is the pygmaeus group in having the fore leg and mid leg basitarsi very elongate, the hypostigmatic cell longer and the eye larger. However, significant morphological differences between *Maracandula* and *Menkeleon* are found in the female terminalia (posterior gonapophysis much more inflated, lateral gonapophyses fused in *Maracandula*), in the basally emarginate fore wing and modified antenna (flagellomere I longer than wide). Species of *Maracandula* are classified in the tribe Gnopholeontini. There are four genera in this tribe that are separated from the related tribes Brachynemurini and Lemolemini by the inflated posterior gonapophysis. The known larvae of Gnopholeontini have the mandibles more closely together than those of the other tribes. Three of the genera of Gnopholeontini lack tibial spurs that are usually present in the other tribes.

Materials and methods

Specimens studied are deposited in the following institutions.
CASC - California Academy of Sciences, San Francisco, California, U.S.A.
FSCA - Florida State Collection of Arthropods, Gainesville, Florida, U.S.A.
MCZC - Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, U.S.A.
TAMU- Texas A&M University, College Station, Texas, U.S.A.
UNAM - Universidad Nacional Autonoma de Mexico, Mexico, DF, Mexico.
USNM - United States National Museum, Washington, D.C., U.S.A.
ZMHB - Museum für Naturkunde der Humboldt Universitat zu Berlin, Germany.

Tribe Gnopholeontini Stange 1994

Diagnosis. Adult. Labial palpus short, palpimacula not extending to apex; hind femur without sensory hair; pretarsal claws not toothed nor strongly bent near base; tibial spurs present or absent; fore wing vein CuP originates distad of cross vein m-cu; fore wing vein 2A runs in a fairly even curve toward 3A; pilula axillaris present, usually well developed; hind wing vein CuA runs close to hind margin, ends near medial fork; hind wing radial sector originates before medial fork, 2 or 3 presectoral cross veins; male abdomen without hair pencils or postventral lobe; male paramere plate-like; female anterior gonapophysis plate-like or membranous; posterior gonapophysis inflated; pregenital plate with tooth; gonapophyseal plate large; female ectoproct with digging setae.

Larva. Mandibular bases close together, separated by about basal width of mandible; mandible with 3 teeth, middle tooth closer to distal tooth than basal tooth; distal tooth not shorter than middle tooth; abdomen without dolichasters or tufted setae along median area, sometimes with lateral scoli.

Biology. Larvae are either free living in sand (*Tyttholeon* Adams), live in protected areas (rock overhangs) (*Menkeleon*) or live on rocks or tree trunks (*Gnopholeon* Stange). The larvae of *Maracandula* are unknown, but evidence suggests they are associated with rocks. Some species (especially *Maracandula*) are afternoon fliers.

Discussion. This tribe is characteristic of the Sonoran Region. The larvae of the different genera are among the most diverse found in the family and are quite distinct one from another. The main defining feature of this tribe is the larval structure, especially the close proximity of the mandibular bases. The adults differ from the Brachynemurini in lacking any well-developed postventral lobe on the male ectoproct and, probably more importantly, in the structure of the female terminalia which have the posterior gonapophysis inflated or enlarged and/or with an enlarged pregenital plate. Most of the genera (except *Gnopholeon* Stange) lack tibial spurs.

Key to Genera of Gnopholeontini

1. Tibial spurs present ..... ***Gnopholeon* Stange**
— Tibial spurs absent **2**

2(1). Wings narrow with sparse venation; male ectoproct produced mesally below; posterior gonapophysis of female subcylindrical; pregenital plate very large ..... ***Tyttholeon* Adams**
— Wings broad with denser venation; male ectoproct not produced mesally; posterior gonapophysis of female greatly swollen; pregenital plate small **3**

3(2). Antennal flagellomere 3 at least 1.5 times longer than wide; fore wing strongly emarginate near base; pretarsal claws more than twice as long as greatest diameter of apical tarsomere; female lateral gonapophyses fused ..... ***Maracandula* Currie**
— Antennal flagellomere 3 about as long as wide; fore wing not emarginate near base; pretarsal claws not much longer than greatest diameter of apical tarsomere; female lateral gonapophyses not fused ..... ***Menkeleon* Stange**

***Maracandula* Currie 1901**

Maracandula Currie 1901: 436. **Type species**: *Myrmeleon pygmaeus* Hagen, by original designation.
= *Microleon* Banks 1901: 365. **Preoccupied** by *Microleon* Butler 1885 (Lepidoptera). **Type species**: *Microleon apicalis* Banks, by original designation.
= *Mimoleon* Banks 1913: 229. **New name** for *Microleon* Banks 1901.

Further description. Stange 1970: 152; 1994: 91.

Key to species. Stange 1970: 153.

Distribution. Mexico.

Description. Antenna with flagellomeres II-IV longer than wide; legs moderately long and slender, fore femur more than 1.5 times longer than fore coxa; hind basitarsus shorter or longer than distal tarsomere; femoral sense hair hardly distinguishable from surrounding bristles, one each on fore leg and mid leg; pretarsal claws weakly developed; tibial spurs absent; wings with banksian lines absent, hypostigmatic cell short, less than six times longer than high; posterior area of hind wing narrow, CuA bends to hind margin near medial fork; pilula axillaris well developed with setae covering most of dorsal surface of knob; male genitalia with rather simple gonarcus, free parameres; mesal margin of male ectoproct with short, rather truncate process near origin of weakly developed postventral lobe, somewhat produced ventrally; female terminalia with posterior gonapophysis extremely enlarged and swollen; lateral gonapophyses fused; pregenital plate pale narrow with median tooth; gonapophyseal plate expansive.

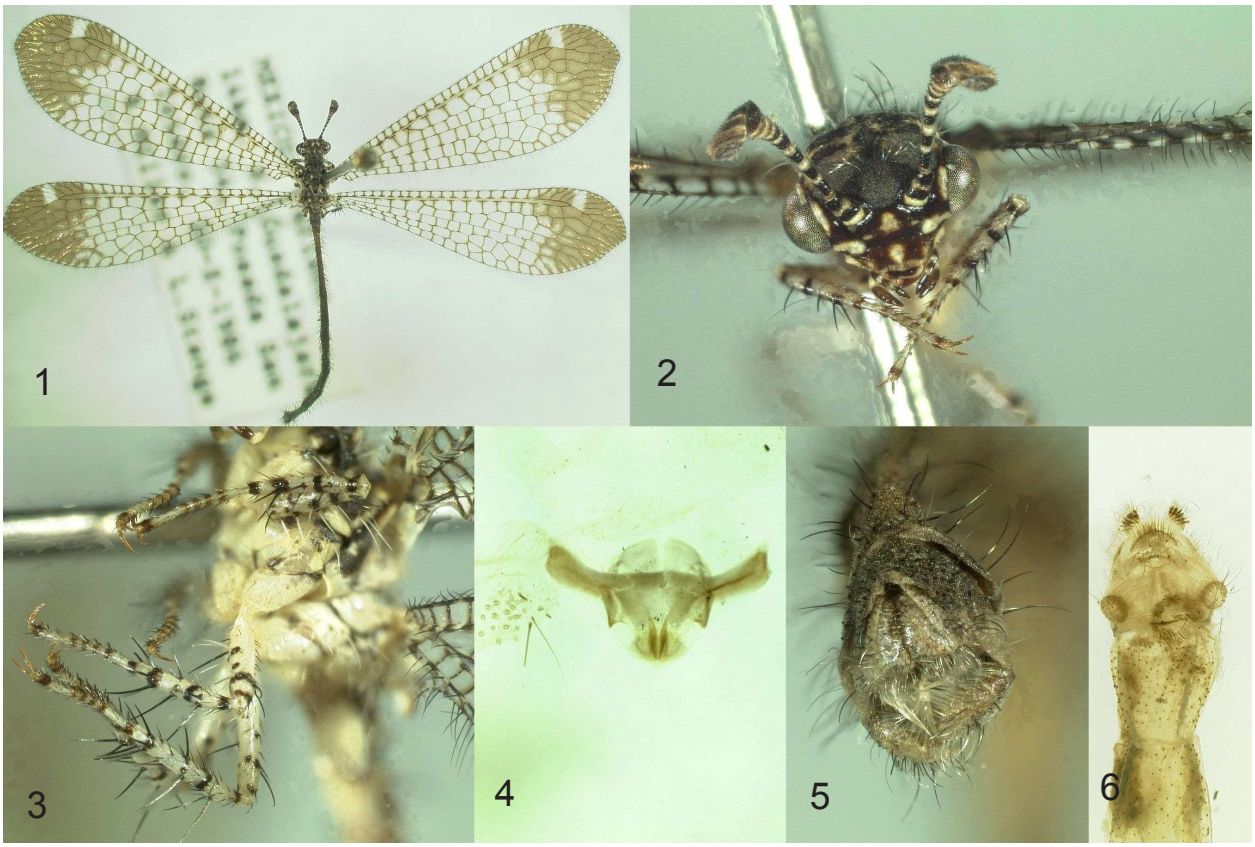

Figure 1-6. *Maracandula apicalis*. **1)** Habitus photo of adult. **2)** Frontal view of head. **3)** Mid and hind legs. **4)** Male genitalia. **5)** Female terminalia (posterior view). **6)** Female terminalia (ventral view).

Discussion. This genus is found only in Mexico. There are five known species that belong to two distinct species groups. The two species of the colima group are more similar to species of *Menkeleon* than are the three species of the pygmaeus group because they have the fore leg and mid leg basitarsus very elongate, the hypostigmatic cell longer and the eye larger. However, significant morphological differences between *Maracandula* and *Menkeleon* are found in the female terminalia (posterior gonapophysis much more inflated, lateral gonapophyses fused in *Maracandula*), base of fore wing emarginate and antenna modified (flagellomere I longer than wide). Miller and Stange (unpublished field notes) found four species flying in the afternoon. The habitat was invariably one with abundant rocks and usually grasses. *Maracandula apicalis* (Banks) was found commonly flying around red top grasses in central Mexico, mostly in sunken areas. The female terminalia suggest that the eggs are laid on rocks but the larvae are unknown. The short hypostigmatic cell is an uncommon character in the family. The female terminalia of *Menkeleon* differ from those of *Tyttholeon* Adams in the small pregenital plate and from *Maracandula* Currie by the separated lateral gonapophyses and the smaller posterior gonapophysis. *Menkeleon* differs from *Maracandula* by the less modified eyes, and lack of prominent subbasal emargination of the fore wing. The afternoon flying habits of *Maracandula* are very unusual since nearly all species of antlions are active at night. Afternoon flying is also documented in the South African genera *Pamares* Mansell and *Pamexis* Hagen. The species of *Maracandula* have reduced eyes and antennal flagellomeres that are probably correlated to their diurnal activity.

Key to species of *Maracandula*

1. Ocular width at least one-half as long as interocular width measured anteriorly, eye reaching near antennal pedicel (Fig. 15, 20); basal tarsomere of fore and mid legs about equal in length to

distal tarsomere (Fig. 17, 22); hypostigmatic cell at least three times longer than high (colima Group) **2**

— Ocular width about one-third interocular width, eye separated from antennal pedicel by at least pedicel diameter (Fig. 2, 10); basal tarsomere of all legs shorter than distal tarsomere (Fig. 3, 11); hypostigmatic cell less than twice as long as high (pygmaeus Group) **3**

2(1). Antenna tricolored, flagellomeres 1 to 5 dark brown to black, next 2 or 3 whitish, followed by dark brown club (Fig. 20); pronotum mostly pale yellow with dark reddish brown areas concentrated along midline; Oaxaca, Mexico ..... ***Maracandula oaxaca* n. sp.**

— Antenna bicolored, flagellomeres 1 to 7 whitish followed by dark brown club (Fig. 15); pronotum mostly dark reddish brown with median pale white stripe; Colima, Mexico ..... ***Maracandula colima* n. sp.**

3(1). Distal tarsomere of hind leg as long as or shorter than basal tarsomere (Fig. 11); pterostigma of both wings yellowish (Fig. 9); membrane distal to stigma suffused with brown on its anterior one-fourth, basad to stigma not suffused; fore wing with only two cells beyond hypostigmatic cell; Puebla, Mexico ..... ***Maracandula puebla* n. sp.**

— Distal tarsomere of hind leg 1.5 times longer than basal tarsomere (Fig. 3); pterostigma of both wings whitish, either membrane not suffused or completely suffused with brown distal and basal to stigma; fore wing with at least 3 (usually 4) cells beyond hypostigmatic cell (Fig. 1) **4**

4(3). Apical one-fourth of both wings prominently suffused with dark brown (Fig. 1); Durango, Jalisco, Mexico ..... ***Maracandula apicalis* (Banks)**

— Wings not prominently suffused with dark brown (Fig. 7); "Mexico" ..... ***Maracandula pygmaeus* (Hagen)**

***Maracandula* - pygmaeus Group**

Diagnosis. Ocular width at most one-fourth interocular width; eye separated from antennal pedicel by at least pedicel diameter (Fig. 2, 10); basal tarsomere of at least fore leg and mid leg shorter than distal tarsomere (Fig. 3, 11); hypostigmatic cell less than twice as long as high (Fig. 1, 7, 9).

***Maracandula apicalis* (Banks)**
(Figure 1-6)

Maracandula apicalis (Banks) 1901: 365 (as *Microleon*). **Lectotype male**, Durango, Mexico (MCZC), designated by Stange 1961: 677.

Taxonomy. Banks 1913: 226 (in *Mimoleon*); Stange 1970: 153 (in *Maracandula*).

Further description. Stange 1970: 153, figures 28, 173, 178, 184, 229 (female terminalia, tarsus, head, male genitalia, wings); Stange et al. 2003: 136, figure 74a (color photo of adult).

Diagnosis. Length to apex of tergite IX about 12 to 14 mm in both sexes. General coloration reddish brown; face pale with extensive dark markings (Fig. 2), median band extending from antennal fossae to labrum, stripes contiguous near middle and extended laterally below and toward middle of eyes; interantennal mark continuous with expansive epicranial mark; labrum mostly dark brown; anterior row of vertex markings consisting of lateral dash and triangular spot at middle which extends posteriorly to posterior median mark, continuous with epicranial mark laterally; middle row with large stripe laterad of middle; posteriorly with irregular spotting laterally and median triangular mark; antenna with alternating dark brown and white flagellomeres; pronotum with broad submedian stripe which bifurcates at furrow; stripes contiguous before furrow, with many dark brown spots at setal bases on pale regions; mesoscutellum mostly dark brown but with narrow pale median line; fore coxa mostly pale brown with

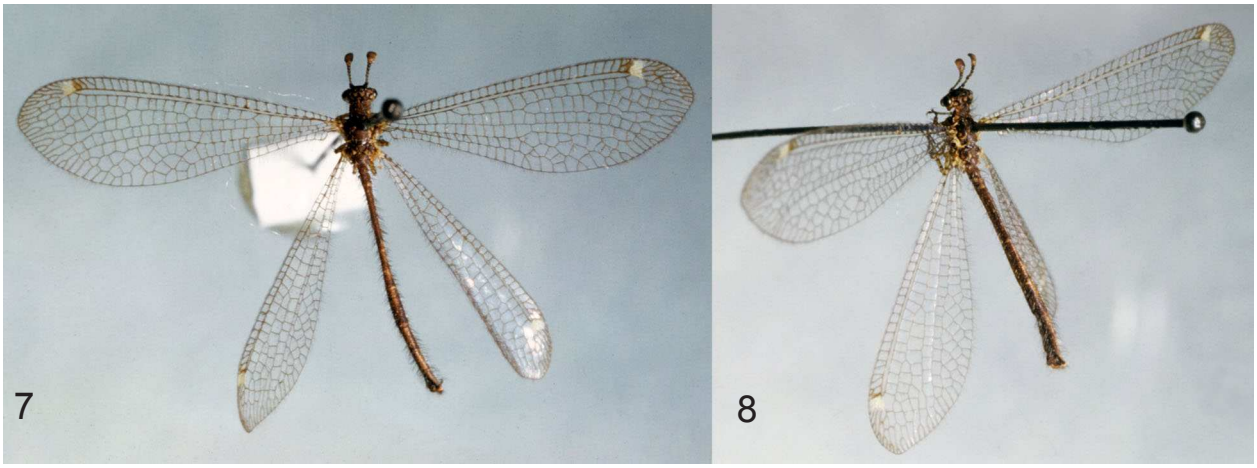

Figure 7-8. *Maracandula pygmaeus*, holotype male. **7)** Habitus photo. **8)** Side view.

small basal dark brown spot and dark brown spot near middle of lateral face; femur and tibia pale with prominent dark brown spotting at setal bases, tibia with series of dark ring-like dark brown marks; both wings prominently suffused with brown, apical one-fourth nearly all suffused with brown with contrasting large white stigmal mark; crossveins of rest of wings broadly margined with brownish; abdomen reddish brown, with some dark brown spots at setal bases. **Chaetotaxy:** Pronotum, mesonotum and abdomen with numerous elongate bristles; scutelli with many outstanding bristles. **Structure:** Antenna with 14 to 16 flagellomeres in both sexes; ocular width about one-fourth interocular width; eye separated from antennal pedicel by at least pedicel diameter; labial palpus slender, distal palpomere weakly swollen; pronotum about 1.5 times wider than long; basal tarsomere of all legs shorter than distal tarsomere, basitarsus of hind leg about 4 times longer than wide; wings as in Figure 1; hypostigmatic cell less than twice as long as high; fore wing with at least 3 (usually 4) cells beyond hypostigmatic cell; abdomen of both sexes much shorter than wings; eighth abdominal segment of male a little higher than long; parameres and gonarcus as in Figure 4; female terminalia as in Figure 5-6.

Distribution. MEXICO. **Durango**: Durango (1m, MCZC). **Jalisco**: 8 miles south Guadalajara, W. F. Williams (9 m, 1f, CASC); 14 km. north Guadalajara, Ruta 54, Posada San Isidro, 10.X.1986, R. Miller and L. Stange (70 m, 65 f, ZMHB; FSCA; TAMU; UNAM; USNM).

Discussion. This species was collected in a large, circular depression (at least 3000 meters across) filled with red top grass, small trees and bushes and many boulders. The slow flying adults flew only in the afternoon and only in the depression. The elevated boundaries defining the depression were barren of adults. Search for larvae in the area such as on the boulders, underneath the boulders, on grass stems and on twigs revealed no larvae. The large density of adults probably indicates that most of the larvae had pupated and emerged. A new search for larvae needs to be conducted in early summer.

***Maracandula pygmaeus* (Hagen)**
(Figure 7-8)

Maracandula pygmaeus (Hagen) 1861: 231 (as *Myrmeleon*). **Holotype male**, Mexico, Deppe (ZMHB).

Taxonomy. Hagen 1887: 216 (?*Maracanda*); Currie 1901: 136 (in *Maracandula*).

Diagnosis. Ocular width about one-fourth interocular width, eye separated from antennal pedicel by at least pedicel diameter; basal tarsomere of all legs shorter than distal tarsomere; pterostigma of both wings whitish, membrane not suffused with brown (Fig. 7); fore wing with at least 3 (usually 4) cells beyond hypostigmatic cell which is less than twice as long as high. Legs mostly pale brown with dark

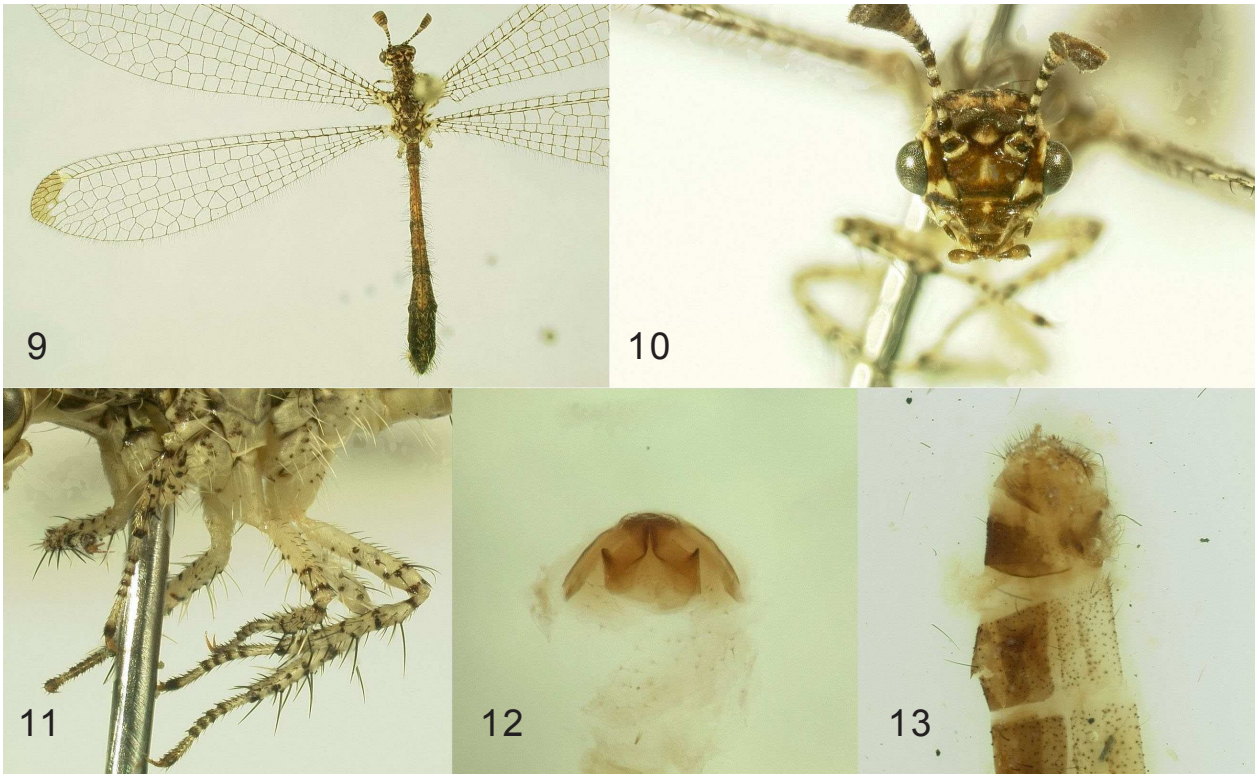

Figure 9-13. *Maracandula puebla.* **9)** Habitus photo of adult. **10)** Frontal view of head. **11)** Mid and hind legs. **12)** Male genitalia. **13)** Female terminalia.

brown spots and subapical dark brown bands on femur; subbasal, medial and subapical dark brown bands on tibia; small apical (mostly reddish brown) brown bands on apices of tarsomeres; claws reddish. Femora with mostly large white bristles with dark brown basal spots; tibiae with black bristles with basal dark brown spots.

Discussion. This species is known only from the holotype male. It is structurally very similar to *M. apicalis* but lacks the rich dark brown suffusion of the wings. Apparently the only known specimen was lost in the mail after the included photographs were taken.

***Maracandula puebla* Miller and Stange, new species**
(Figure 9-13)

Types. Male holotype (FSCA) and 6 m, 5 f paratypes: 13 km. northeast Zapotitlán, Puebla, Mexico, 5.X.1986, R. Miller and L. Stange (FSCA). Additional paratype: Teyuca, Puebla, Mexico, 1524 m, 1.XI.1976, E. Ross (1 f, CASC).

Diagnosis. Ocular width about one-sixth interocular width, eye separated from antennal pedicel by one-half pedicel diameter; labial palpus with distal palpomere moderately swollen; pronotum about 1.5 times wider than long; basitarsus of hind leg equal to distal tarsomere; distal tarsomere on fore and mid legs about 1.5 times longer than basitarsus; pterostigma of both wings yellowish, membrane distal to stigma brown suffused in anterior one-fourth, basad to stigma not suffused with brown; fore wing with only two cells beyond hypostigmatic cell which is less than twice as long as greatest height.

Description. Length to apex of tergite IX 12 mm; fore wing 12 mm; hind wing 11 mm. General coloration dark to light brown, face pale with dark markings; submedian bands extending from antennal fossae to labrum; stripes contiguous near middle and extended laterally below and toward middle of eyes;

interantennal mark continuous with expansive epicranial mark; labrum dark brown with median pale stripe; anterior row of vertex markings consisting of a lateral dash and triangular spot at middle which extends posteriorly to posterior median mark, continuous with epicranial mark laterally; middle row with large stripe laterad of middle, posteriorly with central dark brown triangular and lateral stripes. Antenna with basal five flagellomeres half dark brown and half pale, and distal nine all pale; pronotum with broad submedian stripe bifurcating at furrow with many dark brown spots at bases of pale setae in pale regions; mesoscutellum dark brown with pale anterior lateral patches; fore coxa mostly pale straw colored with small basal dark brown spots and dot near middle of lateral face; femur and tibia pale with prominent dark brown spotting at setal bases; tibia with series of dark ring-like dark brown marks, both wings mostly clear with suffused pale brown areas anteriorly beyond yellow stigmal mark (Figure 9); abdomen pale brown with small dark brown markings at setal bases. **Chaetotaxy:** Pronotum, mesonotum and abdomen with elongate bristles; scutelli with outstanding bristles. **Structure**: Fourteen flagellomeres (Figure 10); ocular width one-sixth interocular distance measured anteriorly; ocular rim separated from antennal pedicel by one-half pedicel diameter; distal palpomere weakly swollen; pronotum about l.5 times wider than long; basitarsus of hind leg equal in length to distal tarsomere; distal tarsomere on fore and mid leg about 1.5 times longer than basitarsus; wing tips evenly overlapping in repose; fore wing with only two cells beyond hypostigmatic cell which is less than twice as long as greatest height; male genitalia as in Figure 12.

Female. Terminalia as in Figure 13.

Discussion. Length to apex of tergite IX about 14 to 17 mm in both sexes. Adults were seen flying in the afternoon in a rocky area with numerous grasses and scrubby plants.

Maracandula - colima Group

Diagnosis. Ocular width at least one-half as long as interocular width, eye reaching near antennal scape (Fig. 15, 20); basal tarsomere of all legs much longer than distal tarsomere (Fig. 16, 21); hypostigmatic cell at least three times longer than high (Fig. 14, 19).

Maracandula colima Miller and Stange, new species
(Figure 14-18)

Types. Male holotype (FSCA) and 5 m, 2 f paratypes: Tepames, Colima, Mexico, 23. X. 1986, R. Miller and L. Stange (CASC; FSCA).

Diagnosis. Adult 14 to 16 mm long. Antenna bicolored, flagellomeres 1 to 9 whitish followed by dark brown club (Fig. 15); pronotum mostly dark reddish brown with median pale white stripe (Fig. 14); tergite VIII two-thirds length of tergite VII; female terminalia as in Figure 18.

Description. Face pale with extensive dark brown markings; submedian dark bands extending from labrum to antennal scapes, becoming darker near scapes and meeting between them; epicranial mark and middle row of vertex pale brown; antenna bicolored with basal nine flagellomeres pale and distal twelve flagellomeres dark brown (Fig. 15); pronotum light brown with pale median stripe and pale spots laterally at furrow; mesoscutellum and metascutellum uniform medium brown; fore coxa pale and unmarked; femur and tibia pale with prominent dark brown spotting at setal bases; all wings unmarked with light brown veins and white stigmal mark; abdomen light brown with mostly dark setae, except for outstanding whitish setae restricted to the lateral posterior margins of tergites 2 to 8; male genitalia as in Figure 17. **Chaetotaxy**: Pronotum, mesonotum and abdomen with numerous elongate bristles; scutelli with many outstanding bristles. **Structure**: Antenna with 21 flagellomeres; ocular width one-half interocular distance measured anteriorly; distance from eye to antennal pedicel about one-third pedicel width; labial palpus slender, distal palpomere weakly swollen; pronotum about 1.3 times wider than long;

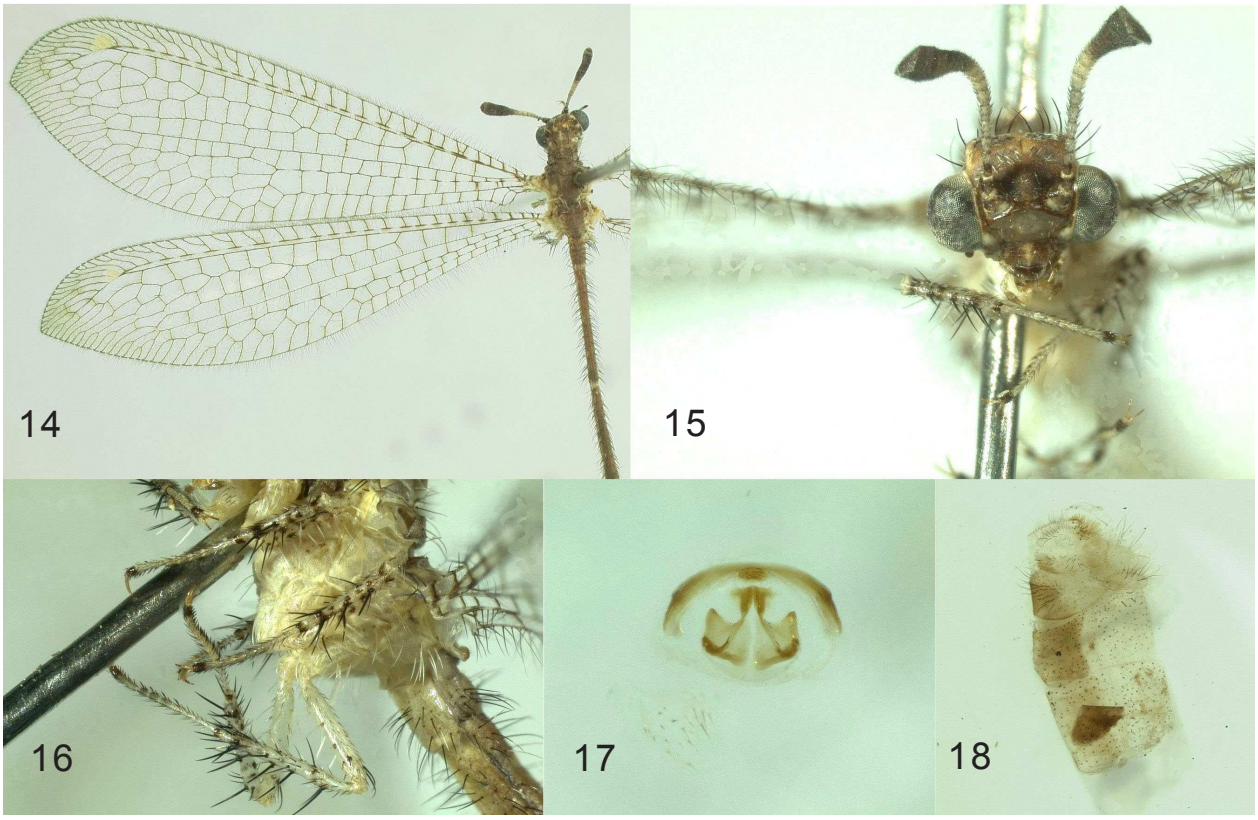

Figure 14-18. *Maracandula colima*. **14)** Habitus photo of adult. **15)** Frontal view of head. **16)** Mid and hind legs. **17)** Male genitalia. **18)** Female terminalia (side view).

basal and distal tarsomeres of fore and mid legs equal, with basal tarsomere about one-fifth longer on hind leg; wings as in Figure 14; hypostigmatic cell about four times longer than high; abdomen shorter than wings. Genitalia as in Figure 17.

Female. Abdomen shorter than wings. Terminalia as in Figure 18.

Discussion. Adults were found in early afternoon in an area with widely scattered rocks or boulders mingled with small trees and grasses. No individuals occurred away from the rocks.Individuals varied in size from 14 to 16 mm in length.

***Maracandula oaxaca* Miller and Stange, new species**
(Figure 19-23)

Types. Male holotype (FSCA) and 26 m, 12 f paratypes: 3 miles south El Camarón, Oaxaca, Mexico, 2.X.1986, R. Miller and L. Stange (CASC; FSCA; UNAM). Additional paratypes: Santa Cruz Huatulco, Oaxaca, Mexico, 23.X.1987, B. C. Ratcliffe, lowland forest (2m, 1f, USNM).

Diagnosis. Antenna tricolored, flagellomeres 1 to 5 dark brown to black, next 2 or 3 whitish, followed by dark brown club (Fig. 20); pronotum mostly pale yellow with dark reddish brown areas concentrated along midline (Fig. 19); tergite VIII one-half length of tergite VII.

Description. General coloration medium brown; face dark brown with central pale area and two lateral off-white spots connected to ocular rim; interantennal mark continuous with dark brown expanded epicranial mark; labrum medium brown with small pale central basal spot; median mark two pale lateral dashes with dark brown dashes connected posteriorly to pale brown triangular mark; antennal flagellomeres

Figure 19-23. *Maracandula oaxaca*. **19)** Habitus photo of adult. **20)** Frontal view of head. **21)** Mid and hind legs. **22)** Male genitalia. **23)** Female terminalia (posterior view).

1 to 5 dark brown, 6 to 8 off white, and 9 to 18 dark brown; pronotum pale straw colored with broad posterior median band reaching three-fourths of distance to furrow; mesoscutellum dark brown; fore coxa mostly pale with dark brown base and crescent-shaped mark near middle of lateral face extending part way around coxa; femur and tibia pale with prominent dark brown spots at some setal bases; wings hyaline with brown wing veins; abdomen brown and unmarked with mostly brown setae. **Chaetotaxy**: Pronotum, prescutum, mesoscutellum, metascutellum and abdomen with elongate bristles. **Structure:** Antenna with 18 flagellomeres; ocular width about one-half its interocular distance measured anteriorly; antennal pedicel separated from ocular rim by one-half diameter of antennal pedicel; labial palpus slender, distal palpomere weakly swollen; pronotum as wide as long; basal and distal tarsomeres of fore and mid leg equal; basal tarsomere of hind leg distinctly longer than distal tarsomere; basal tarsomere about six times longer than wide; wings as in Figure 19; hypostigmatic cell four times longer than high; fore wing with two cells beyond hypostigmatic cell; abdomen shorter than wings; genitalia as in Figure 22.

Female. Abdomen shorter than wings; terminalia as in Figure 23.

Discussion. Individuals were found flying in the afternoon in an area with abundant grasses and rocks intermixed with trees and shrubs.

Acknowledgments

Thanks are due to Dr. Paul Skelley for assistance with the Auto Montage photographs and Drs. Norman Penny, Charles C. Porter, and Catherine Tauber for critical review of the manuscript.

Literature Cited

Banks, N. 1901. A list of neuropteroid insects from Mexico. Transactions of the American Entomological Society 27: 361-370, Plate 12 (figures 1-5).

Banks, N. 1913. Synopses and descriptions of exotic Neuroptera. Transactions of the American Entomological Society 39: 201-242, Plates 23-26.

Currie, R. 1901. A dwarf ant-lion fly. Proceedings of the Entomological Society of Washington 4: 435-437.

Hagen, H. 1861. Synopsis of the Neuroptera of North America, with a list of the South American species, prepared for the Smithsonian Institution. Smithsonian Miscellaneous Collection 4(1): I-XX, + 1-347.

Hagen, H. 1887. Stray notes on Myrmeliontidae. Canadian Entomologist 19: 89-93, 110-112 (Part 1); 133-136, 147-156 (Part 2); 209-217 (Part 3).

Stange, L. A. 1961. Lectotype designations in the New World Myrmeleontidae. Canadian Entomologist 93: 674-677.

Stange, L. A. 1970. Revision of the ant-lion tribe Brachynemurini of North America. University of California Publications in Entomology 55: 1-192.

Stange, L. A. 1994. Reclassification of the New World antlion genera formerly included in the tribe Brachynemurini. Insecta Mundi 8: 67-119.

Stange, L. A., R. B. Miller, and H. Y. Wang. 2003. Identification and biology of Myrmeleontidae (Neuroptera) in Taiwan. I-Lan County Museum of Natural History; Taipei, Taiwan. 159 p.

Received July 15, 2009; Accepted August 31, 2009.